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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/761,532	KAWAI ET AL.	
	Examiner	Art Unit	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2004 and 17 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *17 December 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's compliance with the objections to the drawings in the previous Office Action (mailed on 26 July 2004) is noted and appreciated. The drawings were received on 26 November 2004. These drawings are accepted. Accordingly, the previous objections are withdrawn.

Specification

2. Applicant's compliance with the objections to the specification in the previous Office Action (mailed on 26 July 2004) is noted and appreciated. However, the disclosure is still objected to because of the following informalities:

On p. 2 of Applicant's response filed on 26 November 2004, Applicant made the following amendment to paragraph [0077]:

"element 21 are set to ~~300 mm and~~ 50 mm, respectively."

However, it appears that Applicant may have intended -- element 21 are set to 50 mm and 50 mm, respectively -- instead.

Appropriate correction is required.

Claim Objections

3. **Claim 5** is objected to because of the following informalities:

The phrase, "either or both of at least two upstream sections, extending in the emitter," is still unclear. In particular, "extending in the emitter" is not shown in the figures nor is it clear how upstream sections extend "in the emitter" of the figures. Rather, Applicant explains,

> "Figure 8 shows two upstream sections, extending *from* the emitter (10), of the first and second propagation paths (A, B)" (filed on 26 November 2004, p. 9, last paragraph, emphasis Examiner's).

Examiner suggests amending claim 5 such that "extending *in* the emitter" is changed to -- extending *from* the emitter --, as explained by Applicant.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1-5** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for:

(independent claim 1) "an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated such that a *ratio*...is equal to or higher than a predetermined value,"

does not reasonably provide enablement for:

(independent claim 1) "an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated such that a *ratio*...is equal to or higher than a predetermined value *at or above which a faulty optical-signal transmission is not caused.*"

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. More exactly, note that the claim language appears to relate the value of said *ratio* to the outcome of whether or not a faulty optical-signal transmission is caused. However, this contested limitation is so broad as to include situations where a faulty optical-signal transmission is caused *regardless of the ratio value*. For example, consider the simple situation of an optical signal transmitted with insufficient power. Although the optical axis deviation determines the desired *ratio value*, a faulty optical signal transmission is still caused due to insufficient signal power. The specification does not show how any value of said *ratio* excludes such simple and intuitive examples of a faulty optical-signal transmission being caused. Accordingly, the specification does not enable one to use the invention commensurate in scope with these claims.

6. **Claims 6-10** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for:

(independent claim 6) "said emitter including a light-emitting element having an optical axis thereof deviating from an imaginary line connecting the emitter and the receiver toward the reflector such that a *ratio*...is equal to or higher than a predetermined value,"

does not reasonably provide enablement for:

(independent claim 6) "said emitter including a light-emitting element having an optical axis thereof deviating from an imaginary line connecting the emitter and the receiver toward the reflector such that a *ratio*...is equal to or higher than a predetermined value *at or above which a faulty optical signal transmission is not caused.*"

Similar to the treatment of claims 1-5 above, the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. More exactly, note that the claim language appears to relate the value of said *ratio* to the outcome of whether or not a faulty optical-signal transmission is caused. However, this contested limitation is so broad as to include situations where a faulty optical-signal transmission is caused *regardless of the ratio value*. For example, consider the simple situation of an optical signal transmitted with insufficient power. Although the optical axis deviation determines the desired *ratio value*, a faulty optical signal transmission is still caused due to insufficient signal power. The specification does not show how any value of said *ratio* excludes such simple and intuitive examples of a faulty optical-signal transmission being caused. Accordingly, the specification does not enable one to use the invention commensurate in scope with these claims.

7. **Claims 6-10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claim 6 includes the following limitation:

> "such that a ratio *between incident intensities of first and second optical signals, emitted from the emitter..., and then entering the receiver*, is equal to or higher than a predetermined value at or above which a faulty optical signal transmission is not caused" (emphasis Examiner's).

However, the corresponding specification reads:

> "If the *incident level of optical signal to the light-receiving element 21 is equal to or higher than about 20% of the maximum incident intensity*, no faulty transmission may be caused" (p. 26-27, bridging paragraph, emphasis Examiner's).

Note that the claim language bases non-faulty optical signal transmission on a ratio *between incident intensities of* ***two signals from an emitter***. On the other hand, the corresponding specification bases non-faulty optical signal transmission on a ratio *between an* ***actual incident intensity and a maximum incident intensity.***

Claim 6: ratio ~ $\frac{\text{incident intensity of a first optical signal}}{\text{incident intensity of a second optical signal}}$

specification: ratio ~ $\frac{\text{actual incident intensity level}}{\text{maximum incident intensity level}}$

This difference in subject matter raises the question of whether or not claims 6-10 are sufficiently supported by the written description. That is, the specification teaches that the invention operates according to one specific criterion (ratio between actual incident intensity level and maximum incident intensity level). Claims 6-10 teach that the same invention operates according to a different criterion (ratio between incident intensity of a first optical signal to incident intensity of a second optical signal). Accordingly, this difference raises the question of whether or not claims 6-10 comply with the written description requirement of 35 U.S.C. 112, first paragraph.

Applicant provided the following response, as evidence that claim 6 is supported by the specification:

> "The specification describes in connection with one embodiment that first and second optical signals (B1, B2), emitting from the light-emitting element (11) and being reflected by first and second reflection planes (24, 25), are incident into the light-receiving element (21). *See the specification at page 25, line 25 through page 27, line 8, and Figure 10.* For convenience, it is assumed that the incident intensities of the first and second optical signals (B1, B2) are I1 and I2, respectively. As discussed below, the ratio (I1/I2) corresponds to the ratio of an actual incident intensity and the maximum incident intensity. Furthermore, the ratio (I1/I2) is equal to or higher than a predetermined value as recited in Claim 6. If I2 is greater than I1, the maximum incident intensity is equal to I2. If I2 is blocked or interrupted, the actual incident intensity is equal to I1. In this situation, the ratio (I1/I2), which is equal to or higher than a predetermined value, corresponds to the ratio of the actual incident intensity and the maximum incident intensity. On the other hand, if I1 is blocked or interrupted, the actual incident intensity is equal to I2. In this situation, the ratio (I1/I2=I2/I2=1), which is equal to or higher than a predetermined value, also corresponds to the ratio of the actual incident intensity and the maximum incident intensity. The

> same would apply to the situation where I1 is greater than I2. In view of the above, Claim 6 is supported by the specification. Withdrawal of the rejection is respectfully requested" (filed on 26 November 2004, p. 10, middle paragraph).

Applicant's explanation is appreciated, but Examiner respectfully notes that Applicant's explanation is subject matter that is new and additional to the cited portion of the specification (p. 25, l. 25 – p. 27, l. 8, and Fig. 10). For example, the cited portion of the specification is silent about designating the incident intensity of either of the first or second optical signals as the "maximum incident intensity" of p. 27, l. 5. Also, none of the other embodiments of Applicant's specification designate the incident intensity of a first optical signal as a "maximum incident intensity," relative to the "actual incident intensity" of a second optical signal. Accordingly, Applicant's explanation is not persuasive in showing that claims 6-10 are supported by the specification.

Moreover, the cited portion of the specification conflicts with this new and additional subject matter in Applicant's explanation. In particular, on p. 26-27, bridging paragraph, the specification states, "These [first and second] optical signals never be blocked." This statement conflicts with portions of Applicant's explanation, "If I2 is blocked" and "[I]f I1 is blocked." Accordingly, Applicant's explanation is not persuasive in showing that claims 6-10 are supported by the specification.

Furthermore, the context of the specification implies a usage of the term "maximum incident intensity" that conflicts with the usage of the same term in Applicant's explanation. More exactly, the specification states,

> "If the incident level of optical signal to the light-receiving element 21 is equal to or higher than about 20% of the ***maximum incident intensity***, no faulty transmission may be caused, although the ***minimum incident intensity level varies depending on types of the light-receiving element***" (p. 27, l. 3-7, emphasis Examiner's).

The context of the specification here implies that the usage of the terms "maximum incident intensity" and "minimum incident intensity level" describes *absolute* levels of incident signal intensity received by the light-receiving element. Even the "minimum incident intensity level" *depends on the type of light-receiving element employed*, suggesting an *absolute* value. That is, the operation of the described invention appears to depend on an *absolute* amount of incident signal intensity received *by the light-receiving element, irrespective* of the ratio of the *relative* incident intensities of the first and second

optical signals. Accordingly, Applicant's explanation is not persuasive in showing that claims 6-10 are supported by the specification.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Maue et al.

9. **Claims 1-5** are rejected under 35 U.S.C. 102(b) as being anticipated by Maue et al. (U.S. Patent No. 5,040,168).

Regarding claim 1, Maue et al. discloses:

An optical signal transmission device, mounted to a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space along a first propagation path (blocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensor 1C or 1D in Fig. 5) extending from an emitter to a receiver and a second propagation path (unblocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensors 1C or 1D in Fig. 5) extending from the emitter to the receiver via a reflector (col. 5, l. 35-66) that is disposed outside the emitter and the receiver, the improvement comprising:

an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated (emitter or receiver facing a reflector, i.e. a windshield in col. 5, l. 52-60) such that a ratio (not expressly disclosed but inherently present) of an incident intensity, at the receiver, of a second optical signal propagating along the second propagation path (path of unblocked signal) to an incident intensity, at the receiver, of a first optical signal propagating along the first propagation path (path of blocked signal, col. 6, l. 15-19) is equal to or higher than a predetermined value (i.e. zero, required to be

higher than a value of zero in order to be functional) at or above which a faulty optical-signal transmission is not caused.

Regarding claim 2, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (i.e. transmitter 1A facing a windshield in Fig. 5).

Regarding claim 3, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein said predetermined value is 25%.

Note an exemplary ratio of Maue et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal (along 2nd path including the reflector)}}{\text{blocked signal (along 1st path)}} = \frac{X}{0}, \; X > 0 = \infty$$

Note the ratio of claim 3:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Maue et al. (∞) is higher than the predetermined value (25%) of claim 3.

Regarding claim 4, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein said light-emitting element is disposed that its optical axis (i.e. the axis of transmitter 1A facing a windshield in Fig. 5) coincides with an upstream section, extending from the emitter to the reflector, of the second propagation path (path of unblocked signal).

Regarding claim 5, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein one or more reflector members (plurality of reflecting surfaces in col. 5, l. 35-66) are disposed in either or both of upstream sections, extending in the emitter, of the first and second propagation paths.

Ieda et al.

10. **Claims 1-5** are rejected under 35 U.S.C. 102(b) as being anticipated by Ieda et al. (JP 05-344069 A).

Regarding claim 1, Ieda et al. discloses:

An optical signal transmission device, mounted to a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space along a first propagation path (blocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) extending from an emitter to a receiver and a second propagation path (unblocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) extending from the emitter to the receiver via a reflector (wall surface 20 in Drawing 1 or reflecting plate 23 in Drawing 5) that is disposed outside the emitter and the receiver, the improvement comprising:

an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated (axes of light emitting devices 12 in Drawings) such that a ratio (not expressly disclosed but inherently present) of an incident intensity, at the receiver, of a second optical signal propagating along the second propagation path (path of unblocked signal) to an incident intensity, at the receiver, of a first optical signal propagating along the first propagation path (path of blocked signal) is equal to or higher than a predetermined value (i.e. zero, required to be higher than a value of zero in order to be functional) at or above which a faulty optical-signal transmission is not caused.

Note that the following recitations have not been given patentable weight because they occur in the preamble:

"mounted to a vehicle"

"used to control operation of a vehicle-mounted apparatus"

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding claim 2, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (Drawing 2).

Regarding claim 3, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein said predetermined value is 25%.

Note an exemplary ratio of Ieda et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal (along 2nd path including the reflector)}}{\text{blocked signal (along 1st path)}} = \frac{X}{0}, \quad X > 0 = \infty$$

Note the ratio of claim 3:

ratio ~ 25% = 1/4

The exemplary ratio of Ieda et al. (∞) is higher than the predetermined value (25%) of claim 3.

Regarding claim 4, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein said light-emitting element is disposed that its optical axis (i.e. the axes of various light emitting devices 12 in Drawings 4-5) coincides with an upstream section, extending from the emitter to the reflector, of the second propagation path (path of unblocked signal).

Regarding claim 5, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein one or more reflector members (wall surface 20 in Drawing 1 or reflecting plate 23 in Drawing 5) are disposed in either or both of upstream sections, extending in the emitter, of the first and second propagation paths.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Maue et al.

13. **Claims 6-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Maue et al.

Regarding claim 6, Maue et al. discloses:

An optical signal transmission device, mounted on a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space from an emitter to a receiver, the improvement comprising:

said transmission device (Figs. 1-5) having a reflector (col. 5, l. 35-66) disposed outside the emitter (transmitter 1A in Figs. 3 and 5) and the receiver (modules 3 in Figs. 1-2 or transmitter/sensor 1C or 1D in Fig. 5) and formed with first and second slanted reflection planes (plurality of reflecting surfaces in col. 5, l. 35-66); and

said emitter including a light-emitting element having an optical axis (i.e. the axis of transmitter 1A facing a windshield in Fig. 5) thereof deviating from an imaginary line (line-of-sight between an emitter-and-receiver pair) connecting the emitter and the receiver toward the reflector such that a ratio between incident intensities of first (an unblocked signal) and second (another unblocked signal, col. 6, l. 10-14) optical signals, emitted from the emitter, reflected individually by the first and second slanted reflection planes and then entering the receiver, exists (the ratio is not expressly disclosed but inherently present).

Maue et al. does not expressly disclose:

the ratio is equal to or higher than a predetermined value at or above which a faulty optical signal transmission is not caused.

However, Maue et al. is generally concerned with the successful transmission of a signal, through the technique of multiple instances of the signal along multiple signal paths (col. 6, l. 15-19). Such a technique is often described as redundant transmissions. This technique aids in successful transmission of a signal by transmitting multiple instances of a signal, each instance having the same signal strength. In the case that one of those instances is blocked, the receiver still receives an instance that is not blocked. Thus, successful transmission of the signal is still achieved (col. 6, l. 15-19). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the receiver so that it receives the two optical signals with equal relative intensities, thus making the ratio equal to one (1). One of ordinary skill in the art would have been motivated to do this since doing so is an intuitively obvious feature of redundant transmissions, and it would result in a fault recovery scheme in the case that one of the signals is blocked (col. 6, l. 15-19).

Regarding claim 7, Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said receiver includes a light-receiving element (modules 3 in Figs. 1-2 or to transmitter/sensors 1C or 1D in Fig. 5, col. 6, l. 10-14) for receiving the first and second optical signals, and at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (i.e. transmitter 1A facing a windshield in Fig. 5).

Regarding claim 8, Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said predetermined value is 25%.

Note an exemplary ratio of Maue et al.:

$$\text{ratio} \sim \frac{\text{an unblocked signal}}{\text{another unblocked signal}} = \frac{X}{X}, X > 0 = 1 = 100\%$$

Note the ratio of claim 8:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Maue et al. (100%) is higher than the predetermined value (25%) of claim 8.

Regarding claim 9, Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein the optical axis of the light-emitting element is set to be directed to between the first and second slanted reflection planes (i.e. the central axis of transmitter 1A facing a windshield in Fig. 5 in the case that an unblocked signal is on one side of the axis and another unblocked signal is on the other side of the axis).

Regarding claim 10, Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said reflector is formed with a curved reflection plane (i.e. a windshield in Fig. 5).

Ieda et al.

14. **Claims 6-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ieda et al.

Regarding claim 6, Ieda et al. discloses:

An optical signal transmission device, mounted on a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space from an emitter to a receiver, the improvement comprising:

said transmission device (Drawings 1-9) having a reflector (various wall surfaces in Drawing 1 or reflecting plate 23 in Drawing 5) disposed outside the emitter (optical transmitting unit 11 in Drawings) and the receiver (optical receiving unit 13 in Drawings) and formed with first and second slanted reflection planes (i.e. one wall surface 20 in Drawing 1 and the opposite wall surface that is not shown, note that optical transmitting unit 11 in Drawings 4 and 6 directs light to the left and to the right of unit 11); and

said emitter including a light-emitting element (light emitting device 12 facing the left or right of unit 11 in Drawing 4) having an optical axis thereof deviating from an imaginary line (line-of-sight between an emitter-and-receiver pair) connecting the emitter and the receiver toward the reflector such that a ratio between incident intensities of first (i.e. an unblocked reflected signal) and second (i.e.

another unblocked reflected signal) optical signals, emitted from the emitter, reflected individually by the first and second slanted reflection planes and then entering the receiver, exists (the ratio is not expressly disclosed but inherently present).

Ieda et al. does not expressly disclose:

the ratio is equal to or higher than a predetermined value at or above which a faulty optical signal transmission is not caused.

However, Ieda et al. is generally concerned with the successful transmission of a signal, through the technique of multiple instances of the signal along multiple signal paths (paragraphs [0012-0013]). Such a technique is often described as redundant transmissions. This technique aids in successful transmission of a signal by transmitting multiple instances of a signal, each instance having the same signal strength. In the case that one of those instances is blocked, the receiver still receives an instance that is not blocked. Thus, successful transmission of the signal is still achieved (paragraphs [0012-0013]). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the receiver so that it receives the two optical signals with equal relative intensities, thus making the ratio equal to one (1). One of ordinary skill in the art would have been motivated to do this since doing so is an intuitively obvious feature of redundant transmissions, and it would result in a fault recovery scheme in the case that one of the signals is blocked (paragraphs [0012-0013]).

Note that the following recitations have not been given patentable weight because they occur in the preamble:

"mounted on a vehicle"

"used to control operation of a vehicle-mounted apparatus"

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone.

See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding claim 7, Ieda et al. discloses:

The optical signal transmission device according to claim 6, wherein said receiver includes a light-receiving element (photodetector 14 in Drawing 2, photodetectors 34-36 in Drawing 7, photodetectors 44-46 in Drawing 8, photodetectors 64-66 in Drawing 9) for receiving the first and second optical signals, and at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (Drawing 2).

Regarding claim 8, Ieda et al. discloses:

The optical signal transmission device according to claim 6, wherein said predetermined value is 25%.

Note an exemplary ratio of Ieda et al.:

$$\text{ratio} \sim \frac{\text{an unblocked signal}}{\text{another unblocked signal}} = \frac{X}{X}, X > 0 = 1 = 100\%$$

Note the ratio of claim 8:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Ieda et al. (100%) is higher than the predetermined value (25%) of claim 8.

15. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ieda et al. in view of Rogers.

Regarding claim 10, Ieda et al. does not expressly discloses:

The optical signal transmission device according to claim 6, wherein said reflector is formed with a *curved* reflection plane.

However, reflection planes of myriad shapes are known in the art. Rogers teaches one exemplary shape of a curved reflection plane (Rogers, ellipsoid reflector 21 in Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to form the reflector of Ieda et al. with a curved reflection plane, like that of Rogers. One of ordinary skill in the art would have been motivated to do this since curved reflection planes can have special geometric properties that provide some benefits to the optical transmission device of Ieda et al. For example, the ellipsoid shape of the

curved reflection plane of Rogers automatically directs incident signals from one focal point to another focal point (Rogers, signal paths of 61 and 62 from F1 to F2, col. 3, l. 40-43) and makes the length of all paths from one focal point to the other focal point to be the same, independent of the incident location of a reflected path (Rogers, col. 3, l. 44-47). These properties enable a more focused transmission signal and reduce concerns for worst-case timing and phase shift considerations (Rogers, col. 4, l. 41-44).

Response to Arguments

16. Applicant's arguments filed on 26 November 2004 with respect to independent claims 1 and 6 have been fully considered but they are not persuasive. Applicant states,

> "In summary, the term 'a ratio of the incident intensity of the second optical signal to an incident intensity of the first optical signal is equal to or higher than a predetermined value at or above which a faulty optical-signal transmission is not caused' of the claimed invention is disclosed in neither of Maue or Ieda (26 November 2004, p. 12, Summary section).

Regarding independent claim 1, Examiner respectfully notes that such a ratio is not expressly disclosed but is inherently present. Also, as Maue and Ieda are applied to independent claim 1, the ratio is required to be higher than a value of zero in order for the apparatuses of Maue and Ieda to be functional. Otherwise, no optical signal is received at the respective receivers of Maue and Ieda, and there is no successful transmission of an optical signal.

Regarding independent claim 6, Examiner respectfully notes that such a ratio is not expressly disclosed but is inherently present. However, as Maue and Ieda are applied to independent claim 6, neither Maue nor Ieda expressly discloses that the ratio is equal to or higher than a predetermined value at or above which a faulty optical-signal transmission is not caused. Nonetheless, an obvious argument was applied to address this limitation.

Thus, Applicant's arguments regarding independent claims 1 and 6 are not persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

17. Applicant's arguments filed on 26 November 2004 with respect to dependent claims 3 and 8 have been fully considered. Applicant states,

> "The Examiner asserts that both Maue and Ieda disclose an infinity ratio [(unblocked signal/blocked signal=X/0=undefined]. Applicant respectfully disagrees. The claimed ratio is a ratio of an indirect signal (a second optical signal) from a reflector to a direct signal (a first optical signal) which is opposite to the Examiner's characterization. According to the Examiner's assertion, the ratio of the two signal intensities in the prior art references would be zero (0/X=0).

Thus, Applicant respectfully submits that Claims 3 and 8 are particularly allowable over the prior art" (26 November 2004, p. 13, 1st full paragraph).

Regarding dependent claim 3, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *an indirect signal, a direct signal*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Rather, the signals of claim 3 are limited only to:

"a first propagation path extending from an emitter to a receiver,"

"a second propagation path extending from the emitter to the receiver via a reflector,"

"a first optical signal propagating along the first propagation path," and

"a second optical signal propagating along the second propagation path."

Notice that there is no mention of an *indirect signal* or a *direct signal.*

Still, the "unblocked signal" (Maue, a signal along an unblocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensors 1C or 1D in Fig. 5; Ieda, a signal along an unblocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) *does* refer to signal propagating along a second path, said second path extending from an emitter to a receiver via a reflector (Maue, col. 5, l. 35-66; Ieda, wall surface 20 in Drawing 1 or reflecting plate 23 in Drawing 5). The "blocked signal" (Maue, a signal along a blocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensor 1C or 1D in Fig. 5; Ieda, a signal along a blocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) *does* refer to a signal propagating along a first path, said first path extending from the emitter to the receiver. Thus, Applicant's argument regarding claim 3 is not persuasive.

Regarding claim 8, notice the new grounds of rejection. Thus, Applicant's argument regarding claim 8 is moot.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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DSK

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PRIMARY EXAMINER

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FIG. 5

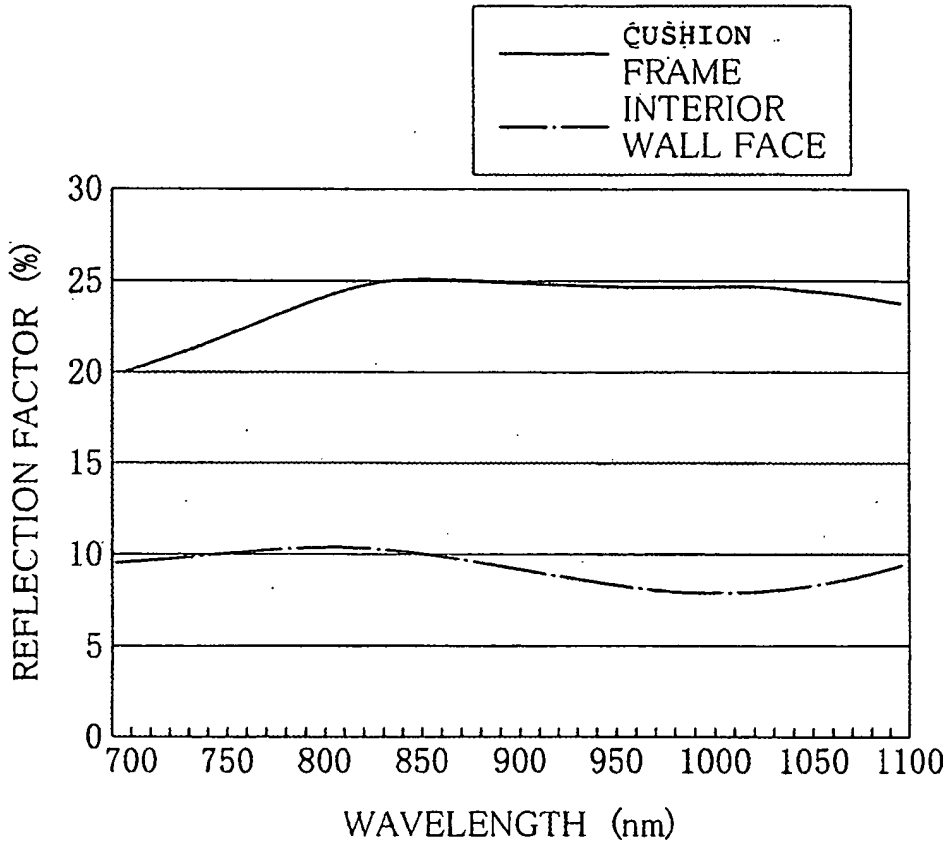

FIG. 6